CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

CONFIDENTIAL

REPORT NO. [redacted]

CD NO.

COUNTRY USSR

DATE DISTR. 22 DEC 50

SUBJECT Production of Metallurgical Equipment in the Soviet Union

NO. OF PAGES 7

PLACE ACQUIRED [redacted]

RETURN TO CIA LIBRARY

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO. [redacted]

SUPPLEMENT TO REPORT NO.

25X1

[redacted]

THIS IS UNEVALUATED INFORMATION

[redacted]

25X1

Present Production of Metallurgical Equipment in the USSR

1. The most important plants in the USSR producing metallurgical equipment are listed here [redacted] All these machine construction plants, with the exception of the Izhorsk plant, belong to the Ministry of Heavy Machine Construction.

UZTM

2. The UZTM (Ural Works of Heavy Machine Construction imeni Ordzhonikidze and also called Uralmash) located in the vicinity of Sverdlovsk is the largest of the plants in the USSR producing metallurgical equipment. Before World War II, the Ural plant was considered to be equal to the NKMZ (Novo Kramatorski Zavod Tyazhelogo Mashinostroyenia imeni Lenina) in Kramatorsk in capacity and identical to it in type of equipment produced. During the war and immediately following it, however, the Ural plant grew tremendously and consequently its facilities for production were greatly increased. This plant was transferred to the Ministry of Tank Construction during the war, and its production, therefore, was mainly directed to fulfill war needs. Adding to its importance is the fact that, besides metallurgical equipment which used to be produced in large quantities by the UZTM, the plant devoted a considerable part of its facilities to produce much mining, refining, and elevator-transport equipment. [redacted] the UZTM used to produce complete units of plant equipment, as well as individual items necessary for reconstruction, and additional equipment for different concerns in the following kinds of industry: blast furnace, open hearth furnace, rolling mills, and forging and press shops.

NKMZ

3. The NKMZ in Kramatorsk is the second most important of these plants. Unlike the UZTM, the NKMZ is located on territory which was occupied by the Germans during the war. A considerable part of the equipment was evacuated; the rest, together with many buildings of the plant, was either damaged considerably or practically completely destroyed. This damage greatly affected the production capacity of the NKMZ after the war. In spite of

STATE	X	NAVY	X	NSRB		DISTRIBUTION					
ARMY	X	AIR	X	FBI							

25X1

energetic attempts to reconstruct the NKMZ completely, it is still considerably behind the UZTM production.

4. Basic lines of metallurgical equipment which were produced by the NKMZ prior to its evacuation were large mills for hot steel rolling. Examples of such mills are the slab rolling mills in Zaporozhe, a rail rolling mill in Azov, a continuous rolling mill of the Dzerzhinski plant in Dneproderzhinsk, and a tin rolling mill of the Moscow plant. After the war, the NKMZ was commissioned to do most of the work for the construction of new Soviet blooming mills which were produced according to the design of the Central Designing and Planning Bureau of Metallurgical Machine Construction. Other products manufactured at the NKMZ include the following: a large quantity of cranes for the metallurgical industry, some structural steel, several Bessemer converters, a large number of cars for carrying slag, large casting molds, anvil blocks for large hammers, and a large number of such supplementary equipment for metallurgical plants as reducing gears, rolling mill stands, and roll gangs.

SKMZ

5. The SKMZ (Staro Kramatorski Zavod Tyazhelogo Mashinostroyenia) is the oldest plant of its type controlled by the Ministry of Heavy Machine Construction. It was built long before World War I and was evacuated in 1941. [redacted] 25X1
25X1 [redacted] after Kramatorsk was reoccupied by Soviet troops, the plant was speedily reconstructed. This plant has always lagged behind in production even though it has a staff of skilled workers and many attempts have been made to modernize it. [redacted] the plant received several modern type metal cutting mills, but retained its old mills, working in many cases without individual drivers. Before the war, the SKMZ used to manufacture equipment for cold rolling mills, and for mills rolling hot steel of small and medium dimensions. Furthermore, the SKMZ produced forging steam and pneumatic hammers and [redacted] blast furnace and open hearth furnace equipment, mostly for the metallurgical industry in the southern part of the country. Such equipment included metal structures for blast furnaces and their mechanical accessories and complete equipment for open hearth shops. The SKMZ, similar to the NKMZ, had a large department handling installation of the produced equipment. If this equipment had to be installed by other personnel, the SKMZ would send its engineers and mechanics to acquaint other personnel with methods of installation and operation of the equipment. This represents a considerable part of the
25X1 work of the SKMZ. [redacted] by 1950 the SKMZ may have attained the level of production of the NKMZ, at least in quality if not in quantity.

NKMZ in Elektrostal

6. The NKMZ in Elektrostal, which started to operate during the war, is con-
25X1 sidered [redacted] fourth in importance in the production of metallurgical equipment. This plant produced live rollers, stapling tables, rolling tables, pushers, and other equipment for new Soviet blooming mills. The plant at Elektrostal has not and cannot achieve the output capacity of the original plant in the Donbas, since it is incomparably smaller than the NKMZ at Kramatorsk. Only part of the equipment of the plant in Kramatorsk was evacuated to Elektrostal.

7. Nothing substantial in the way of equipment which was considerably utilized in the production of the NKMZ in Elektrostal was shipped back to Kramatorsk for restoration in the original plant after the war. Lathes and other equipment were not dismantled in Elektrostal. However, after the war, a small group of workers and other employees (only a score or two) was transferred back to Kramatorsk; some technical records were sent back together with some materials and equipment which were idle at Elektrostal. Among this equipment, however, there was nothing that could have affected production of the NKMZ in Elektrostal.

8. The official name of the Elektrostal plant which has continued to exist, approved
25X1 [redacted] by all governmental levels, is Novo-Kramatorski Zavod Tyazhelogo Mashinostroyenia imeni Stalina v gorode Elektrostal, New Kramatorsk Works of Heavy Machine Construction i/n Stalin in the city of Elektrostal.

25X1 9. [redacted] from the technical and economic point of view the location of this kind of plant at Elektrostal is not logical. In Elektrostal the plant does not have the normal factors favorable to its further growth which were existent in Kramatorsk and which may exist in some other locations. Nevertheless, the plant at Elektrostal was growing after the war; new shops were built; new equipment was purchased and installed; the number of people employed at the plant was constantly increasing. Everything served to indicate that the authorities attached considerable importance
25X1 to this plant. [redacted] in the future the nature of production

25X1

of the plant will be considerably, if not wholly, changed. 25X1

25X1 in the future the NKMZ plant in Elektrostal will produce semi-finished products for other plants, evidently military (ordnance) plants in the region surrounding Moscow. this plant 25X1
will itself be converted to military production. However, additional equipment will have to be installed in the plant for this purpose. The present lines of production will play only a secondary role in the future.

10. On the other hand, if this plant continued to produce only the same kinds of equipment as during the war, its existence at Elektrostal would hardly 25X1
be justified.

the plant was producing mostly metallurgical equipment. Even though this line of manufactured items is very valuable, its production in this region is uneconomical.

IZTM

25X1

11. The IZTM in Irkutsk also began operation during the war.
in volume and importance of production of metallurgical equipment it ranks fifth.

YuZTM (or YuzhZTM?)

12. The YuZTM (Yuzhno Uralski Zavod Tyazhelogo Mashinostroyenia) started to function during the war. It received a part of its equipment from the NKMZ in Kramatorsk, equipment which was evacuated to Orsk. This plant produced cranes; for the new Soviet blooming mills it produced rolling conveyers. A large construction project has been going on in the region of Orsk for the last few years; a new metallurgical combine is being set up in this region. The YuZTM is designated to produce metallurgical equipment for this new combine.

AZTM

13. The Alma Ata Works of Heavy Machine Construction in Alma Ata began to operate during the war or shortly after. It produced some roll gangs for new Soviet blooming mills. Both the YuZTM and the AZTM are modern in every respect and their location deep in the interior of the Soviet Union makes them less vulnerable to enemy attacks in case of war. Although both of these plants were operating at half of their potential capacity in 1945, 25X1
by 1949 or 1950 they should be operating at full capacity and their production should compare in quality and quantity with the NKMZ.

Red Metallist

14. The Red Metallist Works in Leningrad produced all of the lubricating system installations for new blooming mills.

January Uprising

15. The January Uprising plant in Odessa belongs to the group of plants manufacturing elevator-transport equipment and some structural steel construc- 25X1
tions. Formerly it did not produce metallurgical equipment. It is placed in this list as a probable source of cranes, winches, conveyers, metal construction, and other such equipment for metallurgical works. Another reason for including it in the list is the fact that it belongs to the Ministry of Heavy Machine Construction, which is charged with providing metallurgical equipment.

IZTM

16. The Izhorsk Machine Construction Works does not belong to the Ministry of Heavy Machine Construction. It is included in the list because 25X1
25X1 this plant was the chief contractor for the construction of the first Soviet blooming mill which was built in the middle 1930's 25X1
In other words, this plant has a certain experience in metallurgical equipment and it is easily adaptable for this line of production. 25X1
25X1 it is a large plant belonging to the War Ministry.

17. With the exception of the Izhorsk and January Uprising plants, all other plants in the list participated in the construction of the new Soviet blooming mills after the war. One may assume that their line of production at present is also metallurgical equipment.

25X1

Production of Metallurgical Equipment During the War

18. During the fall of 1941, of all the plants listed above only the Uralmash (Ural Works of Heavy Machine Construction in Sverdlovsk) was in operating condition. The rest of the plants were either in a state of evacuation or did not yet exist. However, during the war, the Uralmash was transferred from the Ministry of Heavy Machine Construction to the Ministry of Tank Construction. If the Uralmash did continue to manufacture machinery that was not of military character, such production was not in large volume. During the war, however, this plant was greatly enlarged and this enlargement probably created an opportunity to continue manufacturing metallurgical equipment. [redacted] manufacturing of metallurgical equipment was not completely discontinued during the war, particularly because it was necessary to produce metallurgical equipment after the southern regions were lost for concerns which were not within the reach of the Germans. The establishment of the NKMZ in Elektrostal created this opportunity for production of metallurgical equipment, but only to a small degree. 25X1

25X1 19. [redacted] it is not likely that production of metallurgical equipment in 1944 surpassed the pre-war level. In spite of the fact that during the war several plants of heavy machine construction were established, the new plants could not have achieved by 1944 the volume of the plants which were in Kramatorsk before the war.

Definitions of Metallurgical Equipment and Elevator Transport Equipment

25X1 20. [redacted] in the USSR there is no precisely defined category of Metallurgicheskoye Oborudovaniye (metallurgical equipment). However, this expression is often used with two different meanings: technical and economic.

21. In the technical sense, this expression means all equipment which was designed and constructed specifically for metallurgical concerns, shops, and departments of plants in order, by means of this equipment, to handle all basic metallurgical processes as well as auxiliary processes closely connected with the basic processes. For instance, the category of metallurgical equipment includes such complex aggregates as a rolling mill or a blast furnace, such objects as an open hearth furnace or a Bessemer converter, and such individual pieces of equipment as special cranes, feeding ladles, and slag carriers. On the other hand, such equipment as regular cranes, not special kinds, regular electrical equipment, regular conveyers, and other transport units or installations, strictly speaking, should not be included in the technical category of metallurgical equipment, since such equipment, even though used in the metallurgical process, is also quite regular and useable in other branches of industry.

22. In the economic sense, the term metallurgicheskoye oborudovaniye is used more broadly. It often includes all of the equipment of metallurgical plants or shops regardless of whether this equipment is specifically for metallurgical processes or whether it can be used in some other branch of industry. For example, in 1949, in the Soviet Zone of Germany there was much work done on orders from the Ministry of Ferrous Metallurgy of the USSR. Such orders were called "Chermet orders", or at times "Orders for metallurgical equipment", and sometimes included equipment for the coke industry. In this particular instance the term "metallurgical equipment" should be taken in its economic sense.

23. The category of Podemno-Transportnoye Oborudovaniye (Elevator-Transport Equipment) includes a great number of different elevating and transporting installations, mechanisms, and aggregates which are to be found in all spheres of industrial life. The metallurgical industry uses elevator-transport equipment to a great extent. In the technical sense, however, it is still elevator-transport equipment, while in the economic sense it is considered metallurgical equipment. For instance, the orders from the Ministry of Ferrous Metallurgy distributed among several works in the Soviet Zone of Germany for a large number of special cranes for metallurgical concerns were referred to as orders for "metallurgical equipment". However, in some reports these cranes might be listed under the heading of "elevator-transport equipment".

Technological and Economic Problems

24. The technological and economic problems of the metallurgical industry are so closely connected that often it is almost impossible to separate them.

25X1 As a result of the help from foreign countries, mostly [redacted]

25X1 [redacted] Germany, the number of problems confronting metallurgy in the USSR has been considerably lessened. Technological problems in the USSR are in general closely akin, if not identical, to technological problems in other countries. Specific difficulties, however, have arisen in producing equipment for rolling mills. Most of these difficulties are the result of faulty technical organization; only a few of them are really technological difficulties.

25. Specific problems include the following:

a. Production of planishing rolls of sufficiently good quality for sheet rolling mills and mills for cold rolling. It is very difficult to smelt steel of proper chemical composition and to heat treat it properly.

b. Production of gears to power the rolls (shesterennïye kleti). The particular problem is in the difficulty of cutting the teeth of the gears since lack of specialized equipment means the work has to be done on milling cutters. These tools do not give the desired degree of precision and the process requires too much time.

c. Production of good supports for rolls of stands (rabochi kleti). Specifically, friction and oscillation large bearings of special types for rolls are not manufactured in the USSR.

d. Production of good supports for rolls of several mechanisms of rolling mills which are subject to large and dynamic loads (quite often to axial loads as well). Special friction oscillation bearings of many different types are not manufactured in the USSR.

e. Lack of proper electrical equipment for rolling mills.

f. Absence of plants specializing in manufacturing of specific small pieces of equipment for rolling mills. Because of this, such small pieces of equipment have to be manufactured by plants producing general metallurgical equipment.

g. Absence of proper organization in subletting work from one plant to another in the production of metallurgical equipment. (Under Soviet conditions it is impossible to set up the proper system.)

h. Difficulties in the production of a modern lubrication system of high productivity, centralized and under high pressure.

i. Excessive allowances in forgings and in castings, especially steel castings.

j. Too much wastage and defective material in all phases of production.

k. Exceptional difficulties in providing materials and technical facilities for these orders.

l. Considerable difficulties with manpower: lack of skilled labor.

26. Other problems which the specialists in rolling mills are trying to solve are the following:

a. Rolling steel without processing it into ingots before rolling.

b. Rolling of mass production items of such simple forms as balls, bullets, etc.

c. Rolling of gears.

d. Automatic electric installations of rolling mills

e. Reconstruction and modernization of old rolling mills.

27. The main economic problems in the production of metallurgical equipment in the USSR arise from or are dictated by a combination of the following factors:

a. The necessity of production of an enormous quantity of metallurgical equipment of all types: equipment of most modern design and the equipment which is absolutely necessary for the new metallurgical concerns which are being built in the USSR.

b. Production of large quantities of equipment for reconstruction and modernization of old metallurgical concerns, also production of equipment which was lacking at some plants.

c. Disparity between the production facilities for this large program of construction of metallurgical equipment and the demand for equipment.

d. Lack of skilled personnel on all levels, beginning with mechanics and ending with top level specialists.

e. Organizational and administrative defects and shortcomings which are inherent in the Soviet system.

f. Lack of any material reserves.

g. Insufficiency of funds allotted to the purchase of metallurgical equipment abroad.

h. Relatively low degree of technical knowledge manifested in all stages of production of metallurgical equipment, beginning with the designing and planning of metallurgical plants where the equipment would be operating and ending with the methods of operation of the equipment.

25X1 28. [redacted] steel difficulties may have contributed to the fact that production of metallurgical equipment has been consistently lower than planned. Steel scrap and steel castings were available in adequate quantities; consequently, steel for profile casting and for forgings which are necessary for metallurgical equipment was on hand. There were very considerable difficulties, however, with rolled steel and in particular with steel sheets and profile rolled steel of large dimensions. This last difficulty, plus some delays in processing of forgings of steel castings (even though the raw material for it was available), might have limited the production of metallurgical equipment quite considerably.

25X1 29. [redacted] all these problems will not be solved in the near future by the Soviet authorities. Nevertheless, a great deal has already been done which gives Soviet metallurgy an opportunity to increase production considerably rather soon. [redacted] 25X1

25X1 [redacted] certain types of equipment are not produced, special bearings for instance, but this does not mean that it is impossible to produce them.

25X1 30. [redacted] the most effective, even though quite passive, measure to combat the development of Soviet metallurgy would be a prohibition to sell any kind of metallurgical equipment to the USSR as well as prohibition to render any technical service. [redacted] 25X1

25X1 [redacted] the effects of such prohibition would be felt in the USSR, but not to the extent they would if this measure had been undertaken during the initial period of development of metallurgy in the last stages of the war or directly after it.

Use of American and German Equipment

31. American and German designs for equipment are copied to a great extent. As a rule, however, foreign designs are carefully studied with a critical approach. Upon completion of the study, certain corrective features are sometimes introduced, but the basic principles of construction remain the same. Immediately before World War II, the tendency was to follow the American designs in rolling mills equipment rather than the German, but

25X1 German designs were quite popular a few years before. [redacted]

32. Orders received from the Ministry of Ferrous Metallurgy by plants in the Soviet Zone of Germany were considered very important, especially in 1949. They were considered to be most urgent and had to be fulfilled under the threat of punishment. Furthermore, some plants, Krupp-Grusom for instance, produced much equipment of this kind particularly needed in the USSR for industrial concerns which were being reconstructed after the

25X1 war. [redacted] such equipment was delivered to

its destination as soon as possible and was not left to rust at railroad stations.

25X1 33. [redacted] an enormous quantity of equipment which was manufactured in the Soviet Zone for 24 cement plants in the USSR rusted for a very long period. The reason for this was that the construction of cement plants was going very slowly; even the locations of some of the cement plants were not as yet decided while equipment for the plants had already been shipped from Germany to the USSR.